

FRIEL-105

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By: Daniel D. Friel

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DANIEL D. FRIEL, SR., ET AL.

SERIAL NO.: 10/803,419

FILING DATE: 03/18/04

FOR: PRECISION MEANS FOR SHARPENING:
AND CREATION OF MICROBLADES
ALONG CUTTING EDGES

Hon. Commissioner of Patents
and Trademarks
P. O. Box 1450
Alexandria, VA 22313-1450

SECOND DECLARATION OF DANIEL D. FRIEL, SR.

DANIEL D. FRIEL, SR., hereby declares:

A. I am one of the named inventors for the above identified application.

B. I have previously presented a Declaration in this application.

C. I have reviewed the Office Action of September 26, 2005 and I make the following observations.

1. On page 3, paragraph 2 of the Office Action, the Examiner asserts correctly that Edling achieves a fine smooth finish by a non-grinding means of utilizing a hardened object.

Response: However application Claim 63 claims the creation of a very different edge, not a smooth edge but "to create a microscopic serration along the edge." A very different edge is created by Claim 63 because it utilizes extremely precise control of angle, a non-moving hardened surface, and a different surface geometry on the hardened surface. Edling can not achieve a microscopic serration.

2. On page 3, paragraph 2, the Examiner agrees that Edling uses "a motor driven object".

Response: The Examiner should realize that the technologies of motor driven and manual sharpeners are very different and achieve very different results. Motor driven devices are prone to polish and that is what Edling achieves.

3. On page 3, paragraph 2, the Examiner continues "Edling describes a superior finish by using a steel."

Response: Edling does not achieve a superior finish. His

polished finish is considered inferior by many chefs. Edling cannot demonstrate that he can achieve his results even if the motor is off. His apparatus is incapable of demonstrating the development of microserrations.

4. On page 3, paragraph 2, the Examiner continues "Edling discloses a preferred embodiment of mechanical means."
Response: Edling does not disclose a preferred embodiment that will reproducibly create a microserrated edge. His equipment is crude by modern standards in that it lacks precision angle control in any coordinate. He orients the blade entirely by hand support without a physical reference plane and hence randomly positioned in space. The fact that the edge touches his rotating wheel does not orient the face of the blade or facets in any plane. Hence the angular control is non-existent. Saying he has a guide is clearly a gratuitous statement by Mr. Edling for he has none that controls the blade or facet angle.

5. On page 3, paragraph 3, referring then to Leong the Examiner states "Leong teaches sharpening a knife by manual means. It would have been obvious to one of

ordinary skill in the art, at the time the invention was made to modify the invention of Edling by using a manual means as taught by Leong e.g. to save cost."

Response: Leong like Edling does not have precision angle control when using the steel. In fact Leong also lacks angle control of the blade facet when abrasive sharpening. Like Edling, Leong's design assures that the knife edge can touch the hardened steel surface. However, Leong advises that when steeling (lines 23-26) "it (the blade) is finished by pulling it across one side of the hone 4 and the wheel 9 as indicated by the dotted lines 16 and then across the other side of the hone and the wheel 10 as indicated by the dotted line 17." It is obvious to anyone skilled in the art that (see Figure A attached, which is an enlargement of Leong Figure 1) the angle of the knife face and the angle of the knife facet relative to the steel are uncontrolled as taught by Leong. Only the line of the edge line itself is positioned. There is no angle control of the facets. It is clear that Leong exercises no angle control for the facet during either

sharpening or finishing. Spacial alignment of the edge is totally irrelevant to angular control of the facets. It is the angular control of the plane of the facets when abraded and when finished that matters in edge formation and in the quality and nature of edge created.

When Leong is sharpening (abrading) the face of the blade is not aligned with any surface. Consequently the face can be rotated angularly sufficiently to literally abrade the blade face against the side of the abrasive wheels 9 or 10. Likewise when Leong is finishing the edge, the face of the blade is not angularly aligned with any surface and the facet angle is consequently totally uncontrolled.

In fact, Leong invites a disastrous situation. The blade face can literally be aligned accidentally or intentionally flat against either the surface of the abrasive wheel 9 or 10 or the blade face can be aligned with the surface of the hone 4. In either of these situations the edge itself (the line where the facets meet) will bear directly on the abrasive

surface or be rubbed directly against the surface of the steel and be fatally blunted. The Leong design radically instructs the user to finish the edge by aligning and pulling the blade across and in contact with one side of the hone and the wheel as indicated by dotted line 17. Any physical effect that the steel 4 would have on the edge itself would be totally obliterated as that edge and the opposite facet pass across and in contact with the abrasive wheel and are abraded by the abrasive surface 10. Further, whatever the steel does to a facet on one pull is completely obliterated on the next pull as that facet is abraded by the abrasive wheel. There is absolutely no way that the microserrated edge sought by the present invention would be created by either Leong or Edling or any combination thereof.

6. On page 3, paragraph 4, the Examiner continues "regarding claims 64-79 and 83-86 Edling as modified by Leong meets all the limitations e.g. elongated flat surface (Edling 34)..."

Response: The surface 34 of Edling is not an elongated flat surface. (Line 15 column 4) He

specifically states that the guide is not flat, instead "Preferably the edges 34 are rounded as illustrated." (emphasis added) Likewise Leong does not have an elongated flat surface or in fact any surface to guide the face of the blade. While the line of the edge is aligned, the angle of the face of the blade and the angle of the facet are allowed to be oriented or moved at total random. Neither Edling nor Leong has any precision angle control and consequently neither could create the type of edge conditioning necessary to generate the microstructure along the knife edge as discovered by us and as is the subject of this invention.

7. On page 3, paragraph 5, the Examiner continues "Leong discloses a sharpening apparatus and method meeting all the limitations of claims 63 and 83, except for disclosing a harden object."

Response: No. Leong does not disclose a precision knife guide having a planar knife face contacting surface. (See application claim 63). Surely Leong is not teaching that the face of the blade should be held in sustained moving

contact with the surface of the abrasive coated cylinder. He doesn't preach that and it would of course be a nonsense act that would simply destroy the face of the blades. No one skilled in the art would imagine using an abrasive surface as a guide for the face of a blade.

Response: (Relative to Claim 83) Again Leong does not have a precision knife guide having a planar knife face contacting surface.

8. On page 4, paragraph 3, the Examiner states "Friel meets all the limitations of claims 63 and 83, i.e., knife-edge enhancing or conditioning apparatus and method having a precision angle guide, except for disclosing a hardened object for the sharpening tool."

Response: Based on the common meaning of words as used and recognized by prior patent art and customary usage, the referenced Friel patent does not disclose a knife-edge enhancing and conditioning apparatus but a device for conventional sharpening. The Friel device does have precision knife guides but there would be nothing obvious about eliminating the abrasive action of Friel's abrasive covered metal structure. If one did eliminate the abrasive

and used the underlying metal structure identical to Friel's shape (hardened or not) it would not accomplish what we have now discovered - namely the microserrated structure.

It is important that the referenced Friel patent sharpens both sides of the blade (both facets) simultaneously. There is no way to do that while involving either the Edling or Leong device.

If the Edling wheel (hardened object) were put into the Friel patent's guide structure one would not get a microserrated edge. And of course the Friel patent is not looking for an Edling smooth finish type edge. It would not have been obvious, (contrary to the Examiner's claims) to modify the Friel patent by substituting the hardened object as taught by Edling because the Friel patent specifically did not want to create a fine smooth edge.

9. On page 4, paragraph 4, the Examiner again states, "Edling teaches achieving a fine smooth finish by a non-grinding means of utilizing a harden object. It would have been obvious to one of ordinary skill in the art, at

the time the invention was made, to modify the invention of Friel by substituting the sharpener with a harden object as taught by Edling to obtain a smooth finish."

Response: This is nothing obvious about this to anyone, skilled or not.

Edling preached that you must have very poor angle control (Column 4, lines 46-54) in order to achieve his result of a smooth finish edge. So, why would anyone want to mate his wheel, etc. with a precision guide? Edling promises you it will not work. That is, you will not get a smooth edge.

Similarly if someone replaced the Friel abrasive with the Edling hardened object, nothing would happen. You would get neither a smooth edge nor a microserrated edge. These arguments do not describe a means to duplicate the present invention. Further the Friel reference sharpens both facets simultaneously.

Thus, the Edling wheel cannot be used.

10. On page 4, paragraph 5, the Examiner adds "Regarding Claims 64-68, 70-75, 77-79 and 84-86, Friel as modified by Edling meets the limitations, as noted above and in previous office actions."

Response: This is repetitious of the Examiner's first comments except for Claims 63 and 83. Clearly Edling does not use a precision guide and instead he argues that he requires poor angle control to get his type edge. Edling uses a motor driven, not static, hardened surface. Edling's apparatus does not stress harden the edge and consequently he does not obtain a microserrated edge; his apparatus will not do that and cannot.

D. I have reviewed Claim 87 which I understand is being added by amendment to this application. Claim 87 relates to the spacial relationship of our elongated guide and the shaped hardened surface which should be such that the moving edge is repeatedly wedged against the shaped hardened surface and locally stressed by the wedging action at the point of contact until the stress hardening of edge causes the edge to fracture into a microserrated structure. (See attached Figure B.)

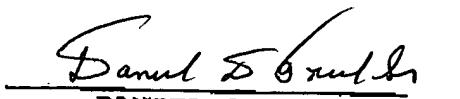
The shaped hardened surface should be sufficiently close to the elongated guide surface that the shoulder on the blade face (where the facet attaches to the blade) acts as a fulcrum to leverage and magnify the force of the hand (holding the blade down and against the guide) into a very large stress on that small contact area between a portion of the edge facet and the shaped hardened object. If you assume a facet length of .020"

and a contact area of 0.005 x .007", a force of one ounce at the top of a 1.5" wide blade would multiply into a force of $1.500/.020 \times 1 \text{ oz.} = 75 \text{ oz.}$ which is about 5 pounds which on that area of 0.000035 inches square is equal to 140,000 pounds/sq.in. This stress level exceeds the strength of steel at room temperature and can readily stress harden or fracture the edge. Note that the calculated 5 pounds (above) corresponds closely to the optimum resistant force we measured at 1-3 lbs. (specification page 22, lines 10-11 and page 6 middle left column - published application.)

In actual practice of our sharpener we scallop out an arcuate recess in the guide surface to accept the rounded steel so that this leverage and forces are fully realized.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

dated: 12/6/05



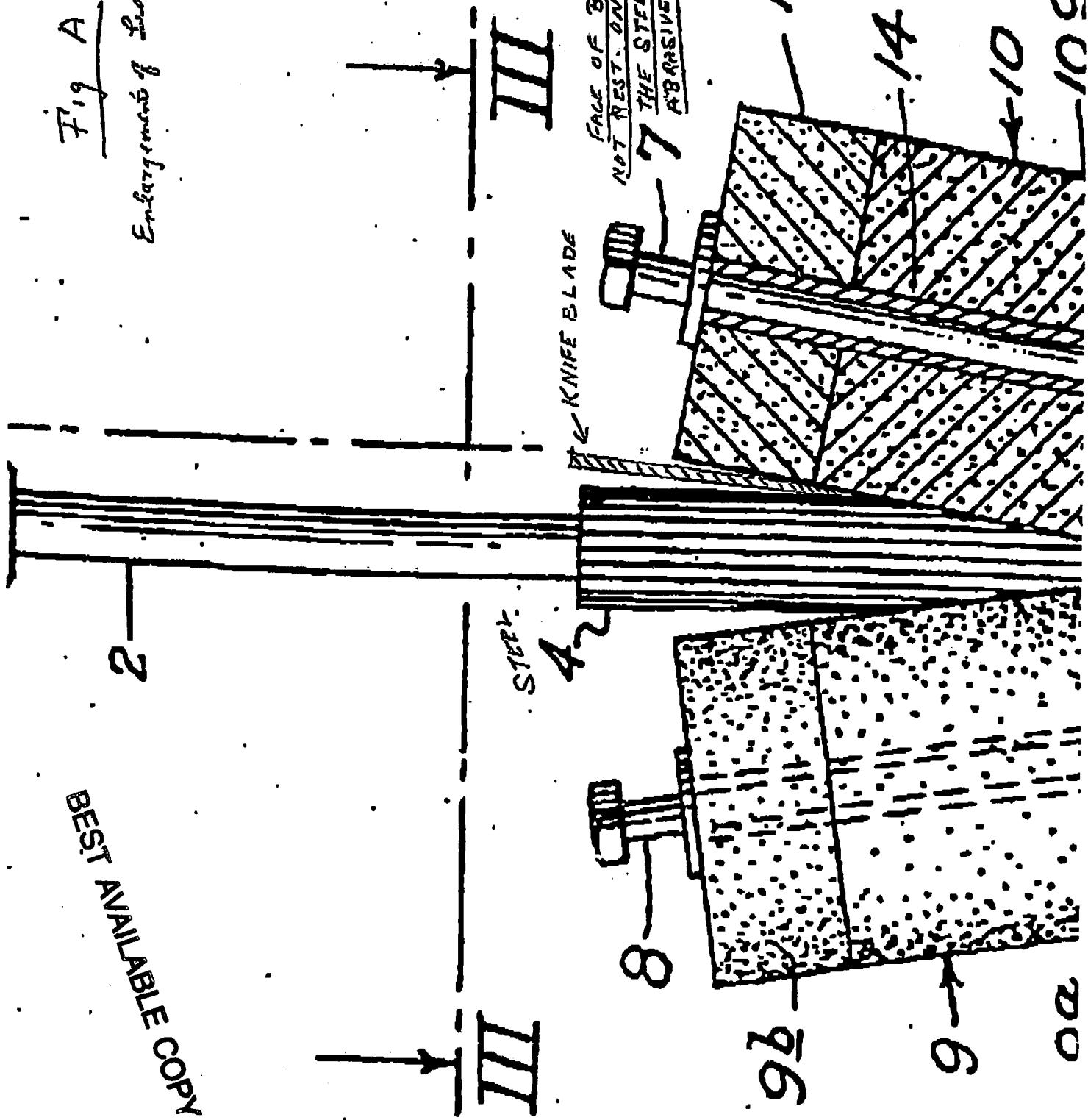
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Fig. A

Engineering Drawing of Fig. A



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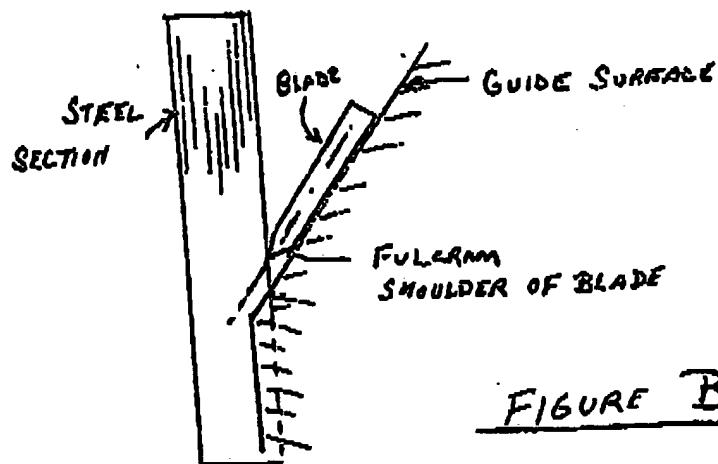


FIGURE B

(SEE OUR FIGURE 11)

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